

REVISION OF THE GENUS *CYCLOCHILA* AMYOT & SERVILLE
(HEMIPTERA-HOMOPTERA, CICADIDAE, CICADINAE)

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Abstract

The Australian genus *Cyclochila* is represented by two species only, one of which, *C. virens*, appears to be confined to North Queensland, the other, *C. australasiae*, is a very common and variable species which ranges from southern Queensland to Victoria and South Australia. It is probably the best known Cicada in Victoria and is very common around Sydney where it is known as the 'Green Monday'.

Introduction

These insects inhabit trees of many kinds. *C. australasiae* normally is found in Eucalyptus trees and rarely less than 6 ft. from the ground. In city and suburban gardens it may be found on almost any species of cultivated tree. In forest country, certain zones or local areas are favoured. Often, when passing along a country road, the shrilling of these insects is almost deafening. Then, travelling on, one suddenly runs out of the sound area and a considerable distance may be covered before another area of the so-called song is encountered. This in itself is not actual proof that this Cicada occurs in zones, because the periods of song vary from a few minutes to an hour or more, and one may pass through areas where the cicadas occur but are not singing. Observations show that certain patches of forest are favoured and not others. Hot sunny days are most favourable to these insects, and often at dusk on warm evenings they may be heard in the trees. The life cycle of *C. australasiae* is believed to occupy a period of seven years. This is assumed by the occurrence every seven years of much greater populations of these insects. The eggs are deposited in furrows in rows on the bark of trees, the young nymphs on emergence fall to the ground and burrow into the soil where they commence feeding on the sap of roots. During their nymphal existence they undergo a series of moults until they emerge from the ground in the pre-adult stage, usually in the early hours of the morning. They crawl up the trunks of trees, the nymphal skin splitting down the back and releasing the adult. Nymphs in various stages of development are often dug up in the bush or in gardens, and they may be found at depths of 3 ft. or even more. *C. australasiae* occurs normally from late October until the end of January. *C. virens* is apparently a local species which inhabits tall trees in rain-forest. Its song is similar to, but slightly louder than, that of *C. australasiae* and, as far as the writer has observed, this cicada never occurs in vast numbers like *C. australasiae*. Nothing is known of its life history stages, but the adults have been recorded from September at least until November.

Summary of External Morphology

GENERAL: Large insects with stout bodies, length slightly more than twice the width, green in colour (*C. virens*); green, yellow, or yellow and black (*C. australasiae*). Wings clear vitreous, tympani (males) visible dorsally between hollow of anterior margin of first abdominal segment and metanotum.

HEAD: Smooth, width slightly more than twice the length, tri-lobed, the median lobe being the largest, ocelli close together and almost equidistant, frons strongly convex, not grooved longitudinally in front. Transverse ridges and interstitial grooves fairly well defined, rostrum extending as far as the posterior coxae.

THORAX: Pronotum, width $2\frac{1}{2}$ times its length, smooth, three sulci on either side of median, hind margin well developed. Mesonotum smooth, cruciform elevation not large, weakly developed, metanotum barely visible. Femora of anterior legs fairly strongly developed, carinate anteriorly and bearing two large and one very small spines. Posterior tibiae with 5 (*C. virens*) or 6 (*C. australasiae*) spines. Wings clear vitreous, length of anterior $1\frac{1}{4}$ times body length, width $\frac{1}{3}$ of its length; length of posterior wings greater than $1\frac{1}{2}$ times their width.

ABDOMEN: Smooth, with fine silvery pubescence along the posterior margins of segments dorsally, operculae almost reaching posterior margin of second abdominal segment.

Measurements of each species are given with the descriptions. All the available specimens of *C. virens* were measured. Of *C. australasiae*, being a very common species, measurements were taken from 36 males and 21 females selected from long series. Full label data are included for *C. virens* only. Specimens examined of *C. australasiae* covered Queensland, New South Wales and Victoria.

Key to the Species of the Genus *Cyclochila*

1. Wings clear vitreous, ocelli close together, bordered with black, tarsi and anterior tibiae brown 2
2. (1) Ocelli light red vitreous, area between costal and median veins of anterior wings green, not wide; external margins of operculae straight; posterior tibiae normally with six spines *australasiae*
Area between costal and median veins green, wide, external margins of operculae slightly concave at the middle 3
3. (1) Ocelli dark golden or pale orange vitreous, posterior tibiae normally with five spines *virens*

Cyclochila australasiae (Donovan)

- Tettigonia australasiae* Donovan, 1805. *Ins. New. Holl.*, Hemip. Pl. X, fig. 1.
Cicada olivacea Germar, 1830, in *Thon. Ent. Arch.* 2:2, Pl. I, fig. 1.
Cicada olivacea Germar, 1834, in *Silb. Rev. Ent.* 2:57.
Cicada olivacea Burmeister, 1839. *Handb. Ent.* (2):182.
Cyclochila australasiae Amyot & Serville, 1843. *Hist. Hemip.* :470.
Cyclochila australasiae McCoy, 1880. *Prodr. Zool. Vict.* decad. 5:57, Pl. I, fig. 1.
Cyclochila australasiae Lucas, 1887. *Proc. Roy. Soc. Vict.* 23:173-178, Pl. I.
Cyclochila australasiae Froggatt, 1903. *Agric. Gaz. N.S.W.* 14:337, Figs. 1-8.
Cyclochila australasiae Goding and Froggatt, 1904. *Proc. Linn. Soc. N.S.W.* 29:569.
Cyclochila australasiae var. *spreta* Goding and Froggatt, 1904. *Proc. Linn. Soc. N.S.W.* 29:570. (syn. nov.).
Cyclochila australasiae Distant, 1906. *Syn. Cat. Hom.* 1:28.
Cyclochila australasiae Froggatt, 1907. *Australian Insects* :349.
Cyclochila australasiae Ashton, 1912. *Mem. Nat. Mus. Vict.* (4) :23.
Cyclochila australasiae var. *spreta* Ashton, 1912. *ibid.*
Cyclochila australasiae Ashton, 1914. *Trans. Roy. Soc. S. Aust.* 38:346.
Cyclochila australasiae var. *spreta* Ashton, 1914. *ibid.*
Cyclochila australasiae Ashton, 1921. *Proc. Roy. Soc. Vict.* 33:92.
Cyclochila australasiae var. *spreta* Ashton, 1921. *ibid.*
Cyclochila australasiae Tillyard, 1926. *Insects of Australia and New Zealand* :162, Fig. Q9.
Cyclochila australasiae McKeown, 1942. *Australian Insects* :98, Figs. 95 and 97.

A very common and widely distributed species in coastal south-eastern Australia, particularly in Victoria and New South Wales as far north as Newcastle. It ranges

a little farther north than Brisbane, and in its northern limits is more abundant in eucalyptus forest at 1,000-2,000 ft. than at sea level. The variety *spretta* named by Goding and Froggatt (1904) is only a colour variety in which the abdomen is black dorsally, the head has a black transverse band extending between the eyes and enclosing the ocelli, the pronotum a median longitudinal black marking extending posteriorly as far as the transverse sulcus, and the mesonotum a median longitudinal black marking with a small triangular black marking on either side near the anterior margin. Various intergrades between the normal form and *spretta* are to be taken together, as also an all-yellow colour variety. There are no structural differences. The writer has collected typical *C. australasiae*, *spretta*, and intergrades from the same trees on the same day (Beaconsfield, Victoria, 30.10.1932).

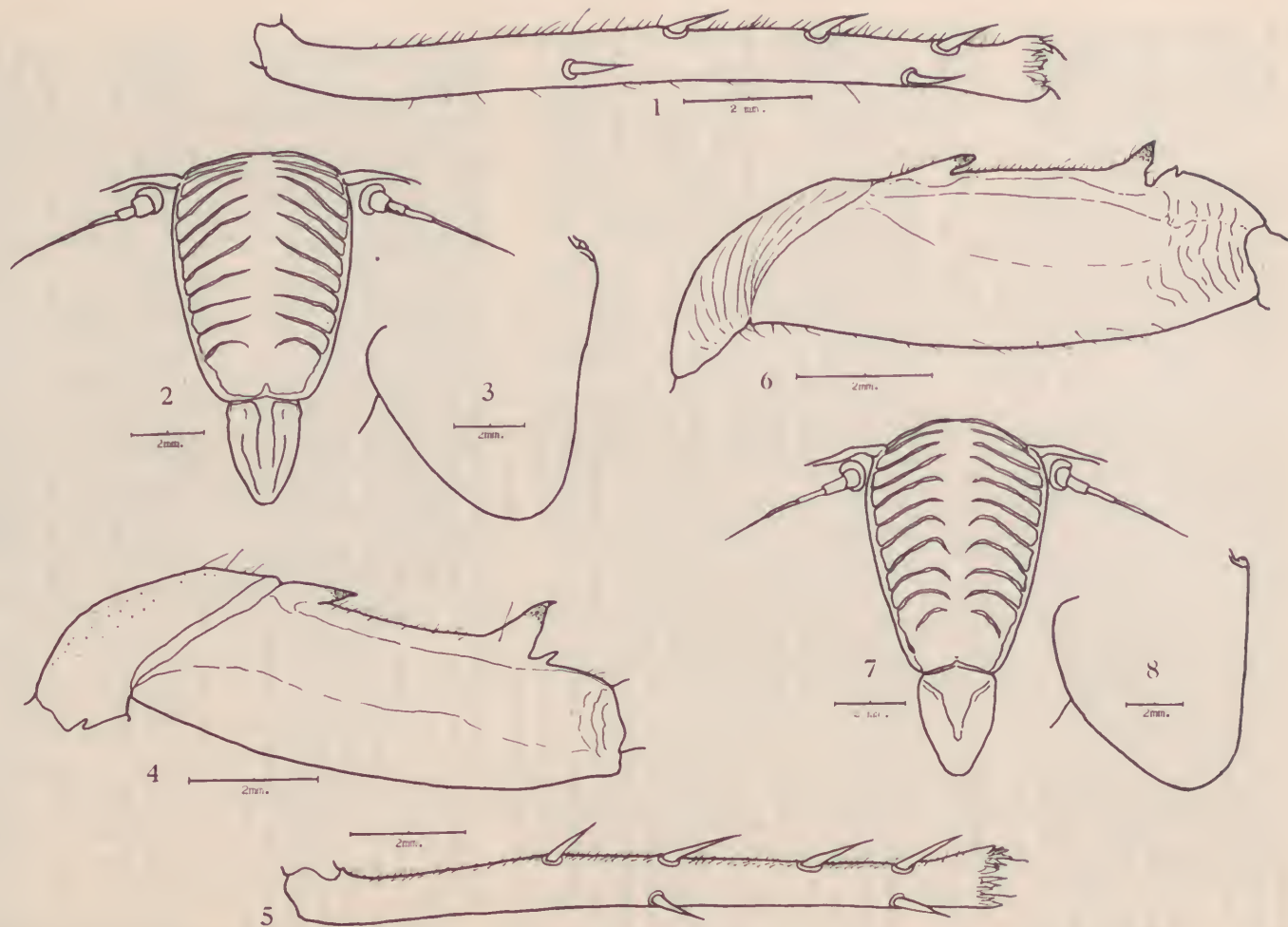
AVERAGE BODY LENGTH: Male 43.5 mm., female 44.2 mm. Maxima of specimens examined—males 50 mm., females 50 mm.; minima—males 37 mm., females 38 mm.

HEAD: Green, $\frac{3}{4}$ width of pronotum, a median sulcus from anterior ocellus to pronotum, another, weakly developed, on each side beyond the ocelli. Margin of vertex of frons darker green, finely striate. Ocelli, garnet vitreous, margined with black, anterior directed forwards and in line with fore-margin of eyes; each lateral directed towards eyes, distance between two posterior not twice that between anterior and each posterior. Antennae, dark brownish-black, basal joint lighter in colour. Frons (Fig. 7) uniformly green, supra-antennal plate green, transverse ridges and lines green, uppermost 4 or 5 lined brownish and very shallow or not even apparent as ridges, 14 in number of which 11 are clearly defined, interstitial grooves shallow, especially the uppermost 4 or 5. Clypeus, green, lateral margins and apical area lightly invested with whitish pubescence, sides with a slightly concave area, medially and longitudinally keeled, about half the length of frons. Labrum, pale yellowish or greenish-brown, grooved longitudinally, sides planate. Labium, yellowish or greenish-brown, sharply grooved longitudinally, apex dark brown or blackish-brown. Genae, green, outer margins faintly carinate. Eyes, green with brownish or pinkish-brown opalescence.

THORAX: Width 20 mm., green, pronotum with two short deep sulci on either side of midline, a third transverse sulcus extending almost as far as the posterior angle of each eye where it curves forwards and forks. Posterior portion of pronotum finely and closely striate transversely. Exterior margin pale yellowish-brown, posterior margin almost horizontal, exterior angles obtuse. Mesonotum green, a small triangular yellowish or greenish-brown marking on either side of midline anteriorly, lateral margins faintly darker green, narrowly invested with whitish pubescence. Cruciform elevation green, not very strongly developed, its anterior ridges sometimes pale yellowish-brown. Metanotum yellowish or greenish-brown, mostly obscured by posterior margin of cruciform elevation.

WINGS: Anterior, male, average length 51.8 mm., width 17.1 mm.; female, length 53.9 mm., width 17.7 mm. Clear vitreous, veins green, area between costal and radial, green, much narrower than in *C. virens*, cell at base of wings between R and Cu2 green. Posterior, male, average length 32.0 mm., width 15.3 mm.; female, length 33.1 mm., width 16.2 mm. Clear vitreous, veins green, anal cell green.

LEGS: Mainly green, moderately clothed with fine short silvery pubescence. Anterior pair with tibiae and tarsi pale brown or yellowish-brown, middle and posterior pairs with distal portion of tibiae and tarsi pale brown; all terminal claws brown widely tipped shining black. Anterior femora (Fig. 6) with two large brown-



FIGS. 1-4.—*Cyclochila virens*—(1) posterior tibia, (2) frons, (3) operculum, (4) anterior femur.
 FIGS. 5-8. *Cyclochila australasiae*—(5) posterior tibia, (6) anterior femur, (7) frons, (8) operculum.

tipped teeth of about equal size and directed slightly upwards, a third very small tooth (in some specimens almost reduced to a tubercle) just beyond the base of the second near the junction with the tibia. Posterior tibiae (Fig. 5) with four brown-tipped spines along the inner side, the first before half-way, second just beyond, other two in distal quarter; outer side with two similar spines, first at half-way, second just anterior to fourth of the inner row.

ABDOMEN: Green, anterior margin (males only) carinate, slightly recurved, open and hollowed on each side of median exposing the tympani which are greyish-white. Operculae (Fig. 8) green, margins very narrowly pale yellowish or yellowish-brown, slightly recurved, interior margins overlapping to half-way or almost so, terminal angles rounded, exterior margins straight, underside of abdomen green.

TYPE:? Type of *C. australasiae* var. *spreti*, Macleay Museum, Sydney.

Cyclochila virens Distant

Cyclochila virens Distant, 1906. *Entomologist* 39:148.

Cyclochila laticosta Ashton, 1912. *Proc. Roy. Soc. Vict.* 24:221, Pl. XLIX, figs. 1a, b.

Cyclochila virens Distant, 1912. *Proc. Linn. Soc. N.S.W.* 37:600.

Cyclochila virens Distant, 1912. *Gen. Ins.* 142:22.

Cyclochila virens Ashton, 1914. *Trans. Roy. Soc. S. Aust.* 38:346.

Cyclochila virens Ashton, 1921. *Proc. Roy. Soc. Vict.* 33:92.

The few specimens of this apparently rather rare species that I have studied have all been taken in a small rain-forest area at Kuranda and Lake Barrine near Cairns, North Queensland. It is found at 1,000 ft. and over from September to December.

AVERAGE BODY LENGTH: Male 42 mm., female 43.3 mm.; maximum 45.0 mm., minimum 42 mm.

HEAD: Green, $\frac{3}{4}$ width of pronotum; a median sulcus from anterior ocellus to anterior margin of pronotum, another from this margin on each side of ocelli where it then forks, one fork running to the posterior margin of the frons, the other outwards to the exterior margin midway between eyes and frons. Margin of vertex of frons slightly darker in colour and very finely striate longitudinally. Ocelli, orange-pink vitreous, margined with black; anterior directed forwards and in line with fore-margin of eyes, each lateral directed towards eyes; distance between two posterior considerably greater than between anterior and each posterior. Antennae reddish-brown. Frons (Fig. 2) green, lateral margins narrowly yellowish-green, darkening slightly and gradually from clypeus towards vertex; supra-antennal plate prominent, edges reddish-brown; transverse ridges and lines 14 in number, the uppermost 3 or 4 lined brownish and very weakly developed giving the appearance of brownish concentric lines; others green, 11 clearly defined, interstitial grooves green. Clypeus green with lateral margins broadly yellowish-green, invested sparsely with very fine silvery pubescence; about half length of frons. Labrum pale yellowish-brown, shallowly grooved longitudinally on either side near anterior margin. Labium pale yellowish-brown, apex blackish-brown. Genae green, outer margins strongly carinate. Eyes green with reddish-brown opalescence, a few fine silvery hairs near orbits beneath.

THORAX: Width 19 mm., green, pronotum with two short sulci on either side of midline, a third commencing at posterior angle of each eye, extending posteriorly to two-thirds then curving inwards and running transversely to median where it meets its opposite. Posterior portion of pronotum finely and closely striate transversely. Exterior margins yellowish-brown, posterior margin almost transverse,

exterior angles obtuse. Mesonotum green, a faint orange-yellow linear marking on either side of midline anteriorly, lateral areas dusted with fine silvery pubescence, exterior margin slightly darker green, carinate. Cruciform elevation green, not strongly developed. Metanotum green, median portion obscured by cruciform elevation.

WINGS: Anterior, male, length 59.0 mm., width 19.0 mm.; female, average length 59.3 mm., width 19.6 mm. Clear vitreous, veins green, area between costal and R green, wide, cell at base of wings between R and Cu2 green. Posterior, male, length 35.0 mm., width 19.0 mm.; female, average length 37.0 mm., width 12.3 mm. Clear vitreous, veins green, anal cell green.

LEGS: Mainly green, and invested sparsely with fine silvery pubescence. Anterior pair with tibiae and tarsi brown, middle and posterior pairs with tarsi brown. Anterior femora (Fig. 4) bearing two black-tipped teeth, proximal smaller and finer than distal, directed upwards; distal stouter and directed outwards and slightly upwards. Posterior tibiae (Fig. 1) with three brown-tipped spines along the inner side, the first at half-way, others almost equidistant from one another. Outer side with one similar spine near distal and just anterior to third spine of inner row.

ABDOMEN: Green, anterior margin (male only) of first segment carinate, slightly recurved, opened and hollowed on each side near median exposing the tympani which are translucent greyish-white with reddish-brown markings. Operculae (Fig. 3) green with margins narrowly yellowish-brown, recurved, interior margins overlapping at base, terminal angles acutely rounded, exterior margin gradually and slightly indented at median. Underside of abdomen green.

TYPE: British Museum.

LABEL DATA: South Australian Museum: 1 ♂ 1 ♀, Kuranda, N. Queensland, no date, F. P. Dodd. Author's Collection: 1 ♀, Kuranda, N. Queensland, 28.9.1952, G. Brooks; 1 ♀, Lake Barrine, N. Queensland, 3.11.1935, A. N. Burns.

References

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Explanation of Plate V

- Fig. 1.—*Cyclochila virens* Distant ♂.
 Fig. 2.—*Cyclochila australasiae* (Donovan) ♂, normal green form.
 Fig. 3.—*Cyclochila australasiae* (Donovan) ♂, yellow form.
 Fig. 4.—*Cyclochila australasiae* var. *spretta* Goding and Froggatt (syn. nov.) ♂.